U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS—MILTON WHITNEY, Chief.

SOIL SURVEY OF GADSDEN COUNTY, FLORIDA.

BY

ELMER O. FIPPIN AND ALDERT S. ROOT.

[Advance Sheets—Field Operations of the Bureau of Soils, 1903.]

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[PUBLIC RESOLUTION—No. 9.]

JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the Congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized into the Bureau of Soils.]

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SOIL SURVEY OF GADSDEN COUNTY, FLORIDA.

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LOCATION AND BOUNDARIES OF THE AREA.

Gadsden County is located on the north central border of the State. Quincy, a town of about 1,000 inhabitants, in the center of the county, is 190 miles west of Jacksonville and 178 miles east of Pensacola by rail. The Georgia State line bounds the county on the north, the

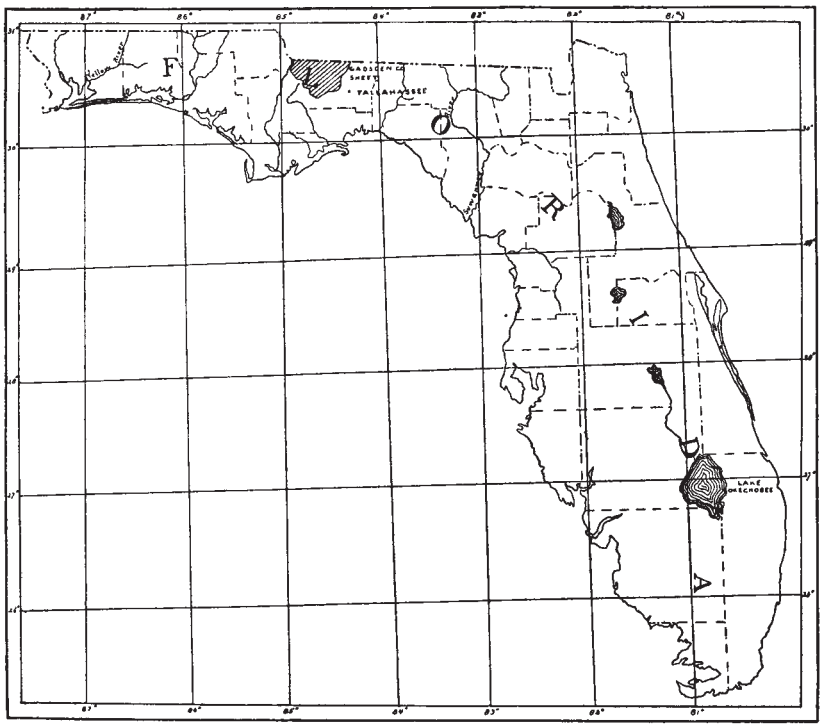

FIG. 1.—Sketch map showing position of the Gadsden County area, Florida.

Ocklocknee River on the east and southeast, and the Apalachicola River on the extreme west. The adjoining counties of Florida are Leon on the east, Liberty on the southwest, and Jackson on the west. The boundary on the southwest is a very irregular line following at

intervals several small streams. Aside from Quincy there are no towns of note in the county. River Junction, in the western part, is the meeting place of three railroads leading to the north, east, and west.

Of the upland counties of northern Florida, Gadsden County may be considered representative in the character of its soils, agricultural development, and value of its products.

The base map—including the roads, streams, railroads, and other geographic features—upon which the distribution of the different types of soil is shown was made by the field party as the investigation of the soils proceeded. To this base has been adapted the plot of the land survey of the area showing section and township lines, which was obtained from the office of the county clerk. It has been found that the survey of the road system does not at all points correspond with the land lines as located in the county, and there is other evidence to prove inaccuracy in the original plotting of the land into sections and lots, resulting in their uneven size and the wrong location of corners. Theoretically the sections are square, as shown on the map in the county clerk's office, but on the land as represented by corner posts still standing they have been distorted. This discrepancy is greatest in the western end of the county, around River Junction. Where there is any question as to the location of areas of soil their position with reference to roads and streams rather than section lines should be considered.

HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

The first settlements in that part of the country now included in Gadsden County occurred between 1820 and 1830, and during the following thirty or forty years it was but sparsely inhabited. Large plantations, some of them covering several thousand acres, were scattered throughout the region, mostly along the streams. The cultivated fields were mainly on the "hammock" lands, consisting of moist, sandy areas lying along streams, and sometimes encroaching on the meadow lands or stream marshes. Each plantation was cultivated under a single management, with overseers to direct the slaves, who performed all the labor. The early settlers were drawn chiefly from the Carolinas, with a few from Georgia and Virginia.

Tobacco, cotton, and corn constituted the principal crops, and the production of these had grown to large proportions about the middle of the last century. Cotton was the most important product, both the long and short staple varieties being grown, and the output was greater then than at present. The tobacco grown was known as the "Florida specked leaf," the seed of which is said to have been brought into the county from Virginia about the year 1830. It was grown entirely on virgin hammock land, and produced a light, spotted leaf,

suitable for cigar wrappers. The product from the fields the second year after clearing was much inferior, and the practice was to plant this crop on newly cleared land exclusively, using the fields subsequently for corn and cotton.

The conditions to-day are quite different from those of the first forty years of agricultural development. The large plantations under one management have given way to smaller holdings, or to the tenant system. The crops grown are about the same, but their relative position has changed, tobacco having become the most important product since the development of the shade-grown Sumatra and the Cuban filler-leaf industries.

CLIMATE.

Unfortunately, no meteorological records were kept in the county until the volunteer observation station was recently located at Quincy, and hence it is impossible to obtain data within the area surveyed bearing on the climatic conditions. The nearest stations having records for a series of years are Thomasville, Ga., and Tallahassee, Fla., both of which are situated to the east of the county. A summary of the Weather Bureau records of temperature and precipitation at these two points for the last five years is given below, and is believed to be fairly representative of conditions within the area surveyed.

Normal monthly and annual temperature and precipitation.

Month.	Thomasville.		Tallahassee.		Month.	Thomasville.		Tallahassee.	
	Temperature.	Precipitation.	Temperature.	Precipitation.		Temperature.	Precipitation.	Temperature.	Precipitation.
	° F.	*Inches.*	° F.	*Inches.*		° F.	*Inches.*	° F.	*Inches.*
January	52.4	3.78	51.5	3.67	August	80.5	6.04	79.6	7.44
February	54.7	3.86	55.0	5.04	September	77.1	4.44	76.7	4.64
March	61.5	3.68	59.8	5.59	October	68.2	3.41	67.8	3.42
April	68.2	3.74	66.9	2.99	November	58.9	2.73	58.9	2.58
May	73.9	4.01	74.5	3.48	December	53.0	4.69	52.8	4.10
June	79.4	4.88	78.8	6.36	Year	67.4	51.83	66.9	57.54
July	81.4	6.57	80.4	8.23					

From this table it may be observed that the annual monthly temperature for the region ranges from 52° in January, the coldest month, to 81° in July, the warmest month. This gives a normal annual temperature of 67.1°. These records of averages are not, however, to be taken to indicate that there does not occur much colder weather, resulting in severe frosts. The dates on which the first and last killing frosts of each season occur are quite variable from year to year, and are shown in the appended records of observations for nine years at Tallahassee, and for five years at Thomasville.

Killing frosts.

Year.	Thomasville.		Tallahassee.	
	Last in spring.	First in fall.	Last in spring.	First in fall.
1893			March 5	November 25.
1894			March 27	November 30.
1895			March 3	November 27.
1896			February 21	
1897	February 28	December 6	January 30	December 28.
1898	February 25	November 23	February 22	November 27.
1899	March 8	November 4	March 8	November 4.
1900		November 13	February 25	
1901	March 7	November 16	March 17	December 15.

The average annual precipitation is between 50 and 60 inches, of which more than half falls during the growing season, from April to September, inclusive. Light snows, which remain only a few hours, fall about once in every four or five years.

The typical general climatic conditions include a rather high relative humidity, variable but quite persistent winds of moderate velocity, and a moderate proportion of clear days.

Under the shades which have been introduced in wrapper-tobacco growing, the atmospheric conditions are considerably altered. The shades of slat and of cloth differ in the extent of their influence, but both tend to increase the temperature. The walls and half cover of the slat shade do not prevent a change of atmosphere, but keep strong winds from sweeping through. When the tobacco plants are well grown the atmosphere is rendered more stagnant and becomes moist and hot. Under the cloth shades the possibilities of atmospheric changes are much less, and anything like wind is prevented. There is a slow filtration of the air through the cloth during wind movements. The atmosphere is very humid, and the cloth develops a higher temperature than the slat covers. These are conditions conducive to the most rapid development of the plants. These matters are discussed more fully in Report No. 62 and Bulletin No. 20 of this Bureau.

PHYSIOGRAPHY AND GEOLOGY.

A broad divide extends from Georgia down through Gadsden County and separates the drainage into two systems. This divide, in addition to its east and west slope, decreases gradually to the southwest and finally ends on the Gulf coast. Its highest point is near Mount Pleasant, in the northwestern part of the county. The two rivers receiving the drainage are the Apalachicola on the west and the Ocklocknee on the east. The latter stream receives five-sixths of the total drainage.

The broad crest of this divide consists of a comparatively flat country. On the west slope are Mosquito and Flat creeks, each with many

branches and heads. Approaching the Apalachicola River the country grows more hilly, and within 6 or 8 miles of that stream the surface is broken, the many small streams having eroded deep channels with steep slopes. This section is the roughest part of the county.

On the eastern side of the divide the streams are much longer and more numerous. Little River, in the eastern third of the county, separates the divide into two portions. The western part slopes gradually off from the flat crest, the streams increasing in number and size until they reach the common channel. Along the lower courses of these streams the country is rolling, and the slopes are frequently quite steep.

On the eastern side of Little River is a minor divide of considerable height, separating that stream from the Ocklocknee, into which it empties at a point 7 miles southwest of Midway. This divide is similar in surface features to the remainder of the county. The crest is fairly level, and the region along the lower courses of the streams is hilly.

All of the streams are bordered by narrow areas of wet and marshy land that are scarcely above the stream level. The width of these fringes is in proportion to the size of the stream, and is greatest along the Apalachicola River, where these areas are sometimes a mile wide on each side of the river.

The higher parts of the divides are commonly occupied by open longleaf pine forests, and of these large areas now exist. Nearer the streams some hardwoods occur, and in the swamps the timber is chiefly hardwood. The pine found in this last position is a shortleaf variety. On the uplands the hardwood timber consists chiefly of sweet gum, oak, walnut, and hickory, while the lowland species are magnolia, sour gum, and cypress.

The materials of which the superficial part of the country consists are unconsolidated clays, loams, and sands, derived from the degradation of the Appalachian axis and deposited in shallow seas. They are a part of the widely extended Coastal Plain and belong largely to the Lafayette formation. The thickness of the Lafayette formation reaches several hundred feet at different points in the county. It occupies all the upland parts of the area, with the exception of narrow fringes of Columbian sands that occur on the lower slopes of nearly all the larger streams. The Lafayette materials were laid down in comparatively shallow, offshore seas, and were influenced by the shifting currents. The most superficial stratum consists of a yellow or red sandy clay, over which is a thin layer of sand or sandy loam ranging from 1 to 5 or 6 feet in thickness.

As evidence of the local modifications of the deposits during this period there are found beds of fuller's earth which outcrop along the courses of nearly all the streams, especially in the eastern half of the

county. At various points are seen exposed bodies of quite pure and variously colored clays. In addition to these there are, in the western quarter of the county, many outcrops of a soft limestone and of other calcareous materials, some of which are said to exhibit the qualities of hydraulic cement.

The Columbian sands, to which reference has been made, represent the most recent depression of the region, which was not sufficient for the sea to overflow more than a small proportion of the land surface. The waters formed estuaries in the mouths of all the largest streams and spread widely over the southern part of the county. The result of this was a deposit of quite clean beach sand that remains to the present time, forming the broad expanses of light sand seen around Midway and south of the Federal road.

These two formations are the only ones that occupy enough of the surface to be worthy of mention.

SOILS.

The soils of the county vary from a very light sand to a medium heavy clay. The soils were classified into nine types. Some of these are here recognized for the first time, but the majority of them have been previously mapped in other areas. In general it may be said that the soils increase in clay content from the south toward the north, and from the streams to the crest of the divides. The clay soils, or soils with clay subsoils, comprise about one-third of the area, while the sandy soils occupy the remaining two-thirds. The names and extent of the different soils are shown in the following table:

Areas of different soils.

Soil.	Acres.	Per cent.	Soil.	Acres.	Per cent.
Norfolk sand	93,120	26.5	Norfolk fine sandy loam	28,096	8.0
Meadow	52,224	14.9	Portsmouth sand	8,640	2.5
Norfolk sandy loam	50,816	14.5	Ocklocknee clay	3,712	1.1
Gadsden sand	45,248	12.9	Total	350,656	
Orangeburg sandy loam	37,248	10.6			
Orangeburg sand	31,552	9.0			

NORFOLK SAND.

The Norfolk sand consists of from 4 to 6 inches of a light, loose, gray sand resting on 3 feet or more of loose, gray or slightly reddish yellow sand. The sand is of medium and coarse grades, but differs in texture in different parts of the county. The type is widely distributed and in the southern part comprises very large and uniform areas. The largest body stretches almost continuously from the Ocklocknee River, near Midway, to the western line of the county, and is

from 3 to 8 miles in width. Another large body fringes the Ocklocknee River for a distance of 10 miles from the Georgia State line, and still other large areas are found on both sides of Little River and around the heads of Willacoochee and Quincy creeks. The area around Gretna, and that part of the type bordering Bear Creek on the south, are much the coarsest in texture of any found in the region. In these positions the sand is mostly coarse, with a noticeable percentage of fine gravel. Along Bear Creek there is mixed with the sand a very fine black silt. In all the other areas of this type the sand is chiefly of medium and fine grades.

The surface is rolling and has something of a billowy appearance throughout the large area west of Little River. Higher up on the divide, and where this soil occurs in small bodies surrounded by other types, the surface is comparatively level. The slopes are never extreme.

The greater part of this type is uncultivated. The soil is the lightest and poorest to be found in the area, and is not very suitable for agricultural purposes. The growth of native timber is very light, and consists chiefly of scrubby oak with an occasional stunted pine tree.

The materials composing the Norfolk sand belong very largely to the Columbian formation, and have been laid down in coastal waters. The sand is rounded and washed clean of fine earth. The depth sometimes exceeds 50 feet, and the porous nature of the soil and the usual slope of the areas insure good drainage.

The crop yields are generally small. Corn produces from 4 to 7 bushels per acre, and cotton from one-sixth to one-fourth of a bale. What cane sirup is produced is of excellent flavor and light color, but the small yield, from 3 to 5 barrels per acre, makes its production unprofitable. The cigar wrapper tobacco grown is of very fine texture, thin and elastic, of good quality, and has good burning properties. It can only be produced by exceedingly heavy applications of fertilizer, and even then a crop is very uncertain without irrigation. This soil is especially adapted to the production of early truck and melons, for which crops it should be highly fertilized. For such purposes its management should include the large application of green manures, with which it would probably be found advisable to use moderate applications of lime to render the soil less open and porous, and to assist in the decomposition of the plant remains.

The following table gives the mechanical analyses of this soil:

Mechanical analyses of Norfolk sand.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8099	Sec. 31, T. 1 N., R. 4 W.	Loose sandy loam, 0 to 4 inches.	0.57	0.38	13.94	33.04	44.94	2.52	1.92	2.70
8103	1 mile NE. of Rosedale.	Loose sandy loam, 0 to 8 inches.	.41	5.90	22.20	19.80	32.80	12.16	3.90	2.98
8100	Subsoil of 8099....	Loose sand, 4 to 36 inches.	.57	.20	11.74	33.80	47.30	2.44	1.40	2.80
8104	Subsoil of 8103....	Loose sand, 8 to 36 inches.	.33	5.20	20.16	20.74	32.08	14.62	3.58	3.30

NORFOLK SANDY LOAM.

The Norfolk sandy loam consists of 6 or 8 inches of a light grayish sandy soil resting on a yellow sandy loam, sticky and cohesive when wet and somewhat hard when dry. The material grows heavier with increase of depth, and at 32 inches a true yellow clay frequently occurs. Over a part of the area of the type iron pebbles are present in considerable amounts, especially around Sycamore and Juniper, in the southwestern part of the county.

This type occurs mainly in one large body of many square miles extent along the crest of the main divide, in the vicinity of Mount Pleasant and around the head of Taluga Creek, chiefly on the western side, where it occupies the crests of the minor divides between Crooked, Flat, and Mosquito creeks. Other areas of much smaller size occur about 3 miles northwest of Quincy and around Midway.

This type constitutes the most level part of the county and forms a broad expanse of comparatively level land. At no point is its surface much broken. It is called the "flat pine woods" land, though its surface is slightly rolling and the main body has a slope to the southwest. On the highest points, between Mount Pleasant and Gretna, the surface is so flat that the drainage is often poor and there exist at frequent intervals throughout the type small, swampy depressions. The water that falls on this type gradually finds its way into the streams, and during most of the year the land is sufficiently dry for cultivation. The percolation of the surface water downward for any great distance is prevented by the comparatively impervious clay that usually occurs at a depth of 3 feet, as well as by a very compact stratum of sand and clay that underlies the yellow clay.

The materials of this type are rather closely related to those of the

Norfolk fine sandy loam. They represent deposits laid down close inland under the influence of shifting currents of water, where the clays already deposited were churned up by the movement of the water, resulting in this large admixture of clay with the sand. The difference between the two types lies chiefly in the much greater depth—30 inches, at the least—of the sandy material which rests on the yellow clay.

A very large percentage of the Norfolk sandy loam is at present covered by a characteristic growth of longleaf pine. The forests are of an open, light character and very free from other trees and from undergrowth.

The native productivity of this soil is about that of the Norfolk sand. The chief crops grown upon it are cotton and corn. The former yields from one-third to one-fourth bale, and the latter from 6 to 10 bushels per acre. Sugar cane, tobacco, and the legumes are also grown. The sirup obtained is of splendid flavor and beautiful light color, but small in amount where fertilizers are not added to the soil. Without fertilizers the soil will produce from 5 to 8 barrels of sirup per acre. Tobacco of the wrapper grade is grown very satisfactorily on this type of soil when sufficient fertilizers are used. The leaf is fine in texture, excellent in quality, and has a good burn. Filler leaf grows rather too light in body to be desirable.

The arrangement of the materials making up the soil and subsoil, with the underlying impervious deposits, combine to form a large reservoir for moisture, and under proper cultivation crops on this soil withstand drought for extended periods. The soil is also susceptible to great improvement.

The following table gives the mechanical analyses of this soil:

Mechanical analyses of Norfolk sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8109	2 miles SE. of Concord.	Dark sandy loam, 0 to 15 inches.	0.94	0.80	6.28	7.42	38.90	32.20	10.30	3.90
8111	2 miles SW. of Mt. Pleasant.	Gray sandy loam, 0 to 10 inches.	.54	.78	10.64	21.52	43.10	12.78	6.50	4.68
8113	2 miles E. of Mt. Pleasant.	Dark sandy loam, 0 to 8 inches.	1 28	1.34	10.92	15.82	39.18	18.70	8.64	5.40
8112	Subsoil of 8111....	Sticky sand, 10 to 36 inches.	.15	.64	9.24	22.84	44.34	14.98	5.18	2.70
8110	Subsoil of 8109....	Yellow sandy loam, 15 to 36 inches.	.10	.82	6.06	6.58	38.52	31.20	10.38	6.44
8114	Subsoil of 8113....	Yellow sand, 8 to 36 inches.	.45	1.44	9.82	13.30	36.84	18.10	8.18	12.32

GADSDEN SAND.

The Gadsden sand consists of a dark-gray fine sand, 10 inches in depth, resting on a gray or brownish sandy loam slightly lighter in texture and extending to a depth of 36 inches or more. The sand is of medium and fine grades and there is usually an admixture of some organic matter. The soil also contains iron concretionary pebbles.

The areas are commonly long and narrow in outline, since they lie for the most part adjacent to streams, and have a moderate slope of from 5 to 12 degrees. The bodies of this soil are generally distributed throughout the county. The largest bodies are found along Little River and its larger tributaries. The type is largely composed of wash from the higher slopes.

Of all the types in the county this is the most desirable for several of the leading crops. In fact, much of it corresponds to the "hammock" land of the earlier days of agriculture in the region, and evidences of its former cultivation are plainly to be seen in many places. In the virgin state the productiveness is probably the highest of any of the types in the county, but its light character renders it less lasting than some of the clay soils. It grows a large variety of crops, among which corn is probably the leading one. The yields of corn are from 12 to 15 bushels per acre; of cotton, from one-third to one-half bale per acre, and of sugar cane, from 8 to 12 barrels of a high grade of sirup. The lighter soils always give the lightest color and best quality of sirup, but are usually lacking in natural productiveness and give less profitable returns, and unless the season be one of frequent rains there is danger of the crop being damaged by lack of moisture.

By the farmer desiring to grow wrapper-leaf tobacco under shade and with irrigation this soil is most to be desired. It produces an almost perfect type of leaf. There is no danger of losing a crop, as is sometimes the case on the clay types of soil when an irrigation is followed immediately by a rain.

In addition to the crops already noted, this soil is admirably adapted to the production of truck crops, berries, and melons.

The following table gives the mechanical analyses of fine earth of this soil:

Mechanical analyses of Gadsden sand.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8107	½ mile NE. of Quincy.	Medium sandy loam, 0 to 10 inches.	0.67	0.90	6.40	11.70	56.80	16.90	2.80	4.24
8105	Near mouth of Little River.	Dark fine sandy loam, 0 to 7 inches.	1.01	5.20	13.36	14.26	35.26	22.86	4.28	4.36
8106	Subsoil of 8105....	Gray fine sandy loam, 7 to 36 inches.	.22	3.70	12.30	13.00	36.90	25.00	4.72	4.16
8108	Subsoil of 8107....	Yellow sandy loam, 10 to 36 inches.	.21	.70	6.50	11.50	54.50	15.36	4.00	7.38

NORFOLK FINE SANDY LOAM.

The Norfolk fine sandy loam to a depth of 8 or 10 inches is a dark-gray sandy loam which grades into a yellowish sandy loam of medium grade and texture, which, at a depth of 16 inches, rests on a yellow sandy clay. The iron content of this soil has undergone a very complete hydration, which accounts for the difference between its color and that of the red clay types, and for its less sticky and plastic character when wet. The sand present is of medium and fine grades. The soil does not bake as hard as some of the other soils of this area. The iron concretions, which are generally present, are of a yellow color.

There are three main bodies of this type. The first occurs around Havana and in the vicinity of Hinson, in the northwestern part of the county. The second lies several miles south of Quincy, and the third is found west of Sawdust, 7 miles below Mount Pleasant. Several smaller bodies are scattered through the northern part of the area, in the vicinity of the State line and on the crest of the main divide around the heads of small streams.

The surface as a whole is fairly level, though it is always slightly rolling and occasionally breaks into steep slopes along the streams. The drainage is fairly good. There occur, however, small, slight depressions in the higher and more level parts that are in the nature of sinks or basins. These are frequently wet and sometimes marshy. Forests of pine are found over much of this type, and the trees are of good size. Hardwood trees are less abundant than on the red soils, but are of the same species.

While tobacco of both the filler and the wrapper type is produced on this soil, it is generally lighter in body and finer in texture than that grown on the red soils, and the burn of the leaf is better.

For the farmer who grows wrappers under shade without irrigation this type is undoubtedly the most satisfactory in the county, and much of the most desirable shade-grown tobacco is at present obtained from this soil. The natural productiveness of this type is probably a little less than that of the Orangeburg sandy loam.

For sugar-cane production this type is the best of any soil in the county. The yield of sirup, of good quality and light color, is from 9 to 13 barrels per acre. The yield of cotton is about one-third of a bale per acre. The returns from corn, oats, and the legumes are also moderate. The type is susceptible of much improvement by the use of green manures.

Along some of the streams in the central part of the county is found a material, derived from the outcrops of deposits of fuller's earth, that has been mapped as Norfolk fine sandy loam, but differs from the typical soil in that it is much finer in texture, of whitish color, and is less productive. The area of this material is small.

The following table gives the mechanical analyses of the fine earth of this soil:

Mechanical analyses of Norfolk fine sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8095	½ mile S. of Havana.	Dark sandy loam, 0 to 12 inches.	1.39	0.60	3.84	7.04	43.14	30.84	6.42	7.22
8097	1½ miles W. of Quincy.	Medium sandy loam, 0 to 18 inches.	1.01	.30	2.84	6.02	42.82	32.82	6.76	8.04
8096	Subsoil of 8095.....	Sticky sandy clay, 12 to 36 inches.	.41	Tr.	2.38	5.30	36.96	22.56	13.46	19.40
8098	Subsoil of 8097.....	Sticky yellow clay, 18 to 36 inches.	.46	.30	2.30	4.60	34.32	26.90	5.90	25.14

ORANGEBURG SAND.

This type is closely related to the Orangeburg sandy loam, differing from it only in the greater depth of sand over the red clay. The depth of the soil, a dark loamy sand, averages 8 inches. Below this are 12 inches of reddish-yellow sandy loam, a grade or two lighter in texture than the soil, which rests in turn upon a stiff red sandy clay like that underlying the Orangeburg sandy loam. Some iron con-

cretions are present, but in smaller amounts than in the case of the Orangeburg sandy loam.

The type occurs in irregular bodies associated with the Orangeburg sandy loam in the northern and central parts of the area. The largest bodies are found on Rocky Comfort Creek, southwest of Quincy, and in the vicinity of Concord and Hinson. Small, isolated bodies frequently occur in the midst of the heavier soils in various parts of the county. The surface features are similar to those of the Orangeburg sandy loam. While some of the slopes are quite steep, there are no extensive areas where the surface is sufficiently broken seriously to hinder cultivation. The Orangeburg sand is a transitional type, and often develops considerable bodies where the red clay grades into the lighter sands. It has no distinctive timber growth, its forests differing from those of the Orangeburg sandy loam only in being less sturdy and luxuriant.

A very large proportion of this soil has been cleared and is under cultivation to all the crops grown in the area. The tobacco, both filler and wrapper, grown on this soil is of good quality, the former yielding from 600 to 700 pounds to the acre. The filler leaf is a little less heavy bodied, while the wrappers are lighter bodied, than those produced on the Orangeburg sandy loam, and the burn is more satisfactory. The color, also, is thought to be a shade lighter on this type.

Cotton yields about one-third of a bale per acre; corn, from 10 to 12 bushels; and cane, 8 or 10 barrels of sirup of fair quality and color. Leguminous crops, such as peanuts, cowpeas, and velvet bean, grow well on this soil.

The soil is only moderately productive, and much can be done by rotation, fertilization, and careful cultivation to improve the yields of all the crops grown on it. The amount of the leguminous crops grown should be increased, especially during those seasons of the year when other crops do not occupy the land. The soil will also produce fair yields of late truck, such as Irish potatoes, sweet potatoes, and cabbage.

The following table gives the mechanical analyses of this soil:

Mechanical analyses of Orangeburg sand.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8123	1 mile SE. of Moseley Cross-roads.	Medium, brown loam, 0 to 18 inches	0.30	0.90	8.84	13.28	48.70	16.24	5.58	6.36
8125	½ mile N. of Havana.	Loam to clay, 0 to 22 inches.	.45	.84	9.40	16.62	44.78	15.00	5.24	7.48
8127	1 mile W. of Quincy.	Brown sandy loam, 0 to 20 inches.	.43	.70	5.78	8.98	45.24	25.14	5.70	8.28
8126	Subsoil of 8125.....	Red clay loam, 22 to 36 inches.	.34	.40	6.98	13.08	41.40	14.50	5.22	18.28
8128	Subsoil of 8127.....	Stiff red clay, 20 to 36 inches.	.31	.80	5.30	7.02	37.90	20.46	5.00	23.34
8124	Subsoil of 8123.....	Stiff red sandy clay, 18 to 36 inches.	.20	1.06	5.34	8.84	36.72	13.86	5.44	28.04

ORANGEBURG SANDY LOAM.

The Orangeburg sandy loam consists of 10 inches of a dark-brown loam ranging from a heavy loam to a light sandy loam. The sand contained is of medium grade. The subsoil is a very dark red clay, stiff and plastic when wet, always containing a noticeable percentage of medium and fine sand. It extends to a depth of several feet, and when exposed has the peculiarity of forming a very hard crust by which it is able to resist erosion to a marked degree. Both the soil and subsoil usually contain iron concretions varying in size from fine gravel to pebbles several inches in diameter. The color of these concretions is a dark reddish brown.

The Orangeburg sandy loam occurs in areas of irregular outline throughout the northern part of the county. The largest and most nearly continuous areas lie around Quincy. A large body of this soil occurs near the Ocklocknee River north of Midway, and a second considerable body is found in the vicinity of River Junction. The surface is always rolling and the slopes are usually gentle, except adjacent to the streams, where they are sometimes rather precipitous. Along the Apalachicola River, where there are many small streams and ravines, the surface is very rough and irregular, so much so that cultivation would be difficult.

A large part of this type has been cleared and is under cultivation. The native timber consists principally of a heavy growth of longleaf pine, sweet gum, black walnut, liveoak, and hickory. Good natural drainage is insured by the rolling character of the surface. The dark-

red color of the subsoil is due to the presence of large amounts of oxide of iron.

For general farming purposes this type is the best of the heavier soils of the area. It is very fertile, gives good returns from year to year, and responds readily to generous treatment. The subsoil is sufficiently impervious to prevent rapid leaching, and fertilizers are retained well.

The chief crops grown on this soil are tobacco, cotton, corn, oats, sugar cane, and the legumes. The tobacco is of the filler grade. The Havana type yields from 600 to 800 pounds per acre when 200 pounds of a complete fertilizer are added to the soil. This soil is also used for growing the Sumatra wrapper. Of the two types the filler is produced most satisfactorily. The leaf is dark and heavy and of excellent quality and aroma. There is, however, more difficulty in securing a satisfactory burn on this soil than on any other soil in the county, and the trouble is increased by growing the tobacco under shade.

Cotton thrives best on this soil and yields from one-third to one-half bale per acre. Corn yields from 8 to 12 bushels per acre, which is not as good a yield as may be obtained from some of the sandy loam types. While sugar cane grows well and returns a large quantity of sirup—from 10 to 14 barrels per acre—the quality is not of the best and the color is poor.

The type is well adapted to the production of cotton, grain, and forage crops, including the legumes, and to the growth of a filler tobacco. By conservative management and the growing of leguminous crops its productiveness may be greatly increased.

The following table gives the mechanical analyses of this soil:

Mechanical analyses of Orangeburg sandy loam.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8121	4 miles W. of Quincy.	Brown sandy loam, 0 to 10 inches.	1.04	0.36	1.84	4.86	48.02	28.80	9.26	6.84
8117	1½ miles SW. of Moseley Cross-roads.	Brown sandy loam, 0 to 8 inches.	.43	1.50	6.18	9.58	46.96	20.98	7.24	8.22
8119	½ mile W. of Hinson.	Dark sandy loam, 0 to 8 inches.	1.91	.70	3 74	6.32	47.24	25.96	6.80	8.54
8122	Subsoil of 8121.....	Stiff red clay, 10 to 36 inches.	.31	.00	1.70	3.60	30.90	27.36	5.96	30.44
8118	Subsoil of 8117.....	Stiff red clay, 8 to 36 inches.	.34	.66	3.96	7.00	33.84	15.38	4.84	34.18
8120	Subsoil of 8119.....	Stiff red clay, 8 to 36 inches.	.42	.52	2.92	5.24	34.26	16.42	5.40	34.68

OCKLOCKNEE CLAY.

The Ocklocknee clay consists of from 8 to 15 inches of sandy loam of variable texture, resting on a stiff, tenacious clay of dark-yellow or mottled-red color. The soil ranges from a light sand, occurring in small bars, to a heavy loam. The color of the subsoil is occasionally almost black, and the material includes a noticeable amount of very finely divided quartz. At one point below Midway bricks are manufactured from the subsoil.

This type is of small extent and is found in four bodies along the Ocklocknee River, from a point near Midway northward nearly to Cotton Ferry. A fifth small body lies on the east side of the mouth of Little River.

The Ocklocknee clay forms the lowlands along the river and is subject to occasional overflow, but is not marshy or swampy. Small depressions occur in its surface and generally contain standing water. Scarcely any of the type has been cultivated, and it is mostly occupied by a strong growth of longleaf pine. The periodical inundations of the surface are a continual barrier to cultivation.

The following table gives the mechanical analyses of this soil:

Mechanical analyses of Ocklocknee clay.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8115	3¼ miles NE. of Midway.	Heavy dark loam, 0 to 8 inches.	2.76	1.06	5.48	7.70	30.84	17.10	14.44	23.38
8116	Subsoil of 8115.....	Stiff yellow clay, 8 to 36 inches.	.46	.80	4.60	6.10	26.86	11.88	9.32	40.30

PORTSMOUTH SAND.

The Portsmouth sand is found in natural depressions with an impervious bottom and poor drainage, chiefly in the areas of sandy soil. It consists of a black sandy soil from 8 to 20 or 30 inches in depth, which has accumulated in these marshy depressions. The subsoil is a compact watery sand or a white, sandy, pasty material. The very moist condition has conduced to the large accumulation of organic remains, which impart to the soil a dark or black color.

The largest bodies of Portsmouth sand occur at irregular intervals along the Ocklocknee River, at a distance of 1 or 2 miles from the main channel. It is also found around the heads of Bear, Ocklawaha,

and Hammock creeks, in the southwestern part of the county. In these positions the surface is almost flat, so that there is little flow of the water in any direction. The type sometimes finds its origin in the near approach to the surface of a stiff clay on a gentle slope, where it receives the drainage of large bodies of deeper sand occurring above. This is the condition in the vicinity of Wetumpka and in the most southerly part of the county.

Small, and much more distinct, depressions occur along the crest of the main divide around Mount Pleasant. The swampy condition is most accentuated in this last position. The soil is more nearly a loam and the areas are distinctly swampy. Sour gum, sweet bay, and cypress trees thrive in such places.

By cutting ditches to remove the water from the surface much of this type can be brought under cultivation at a relatively small expense. When reclaimed it is very productive, has the property of retaining moisture, and is well adapted to potatoes, truck crops, and celery. It is also a good soil for sugar cane.

The following table gives the mechanical analysis of this soil:

Mechanical analysis of Portsmouth sand.

No.	Locality.	Description.	Organic matter.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
8094	2¼ miles E. of Mt. Pleasant.	Dark sand, 0 to 36 inches.	0.60	3.10	13.92	17.20	35.60	24.30	3.70	1.30

MEADOW.

All the streams in the area mapped are fringed by low, flat lands that are wet, poorly drained, and subject to frequent overflow. The soils are a rich, dark loam of variable texture, derived from the higher country through sedimentation. These soils have been mapped as Meadow. As a rule the line between the Meadow and the upland soils is distinctly marked by a sharp scarp. The extent of this lowland is usually in proportion to the size of the stream, except along the Ocklocknee River, where it has been modified, and forms the Ocklocknee clay and Portsmouth sand. The broadest strips are along the Apalachicola River.

Since this soil is too wet for cultivation it has little present agricultural value except for pasturage and hay. When cleared and drained it makes a rich, productive soil.

AGRICULTURAL METHODS.

There is an apparent deficiency of organic matter in all of the upland soils, both virgin and cultivated. With the former, this condition arises from the scanty undergrowth in the native forests, and from the annual fires that are allowed to burn off the dead stems of the former years' growth in order to expose and stimulate the thin setting of grass. In the cultivated state the lack of humus results from a system of farming that has not followed a conservative crop rotation nor introduced crops for green manure.

The natural low productivity is a condition common to large areas of the Coastal Plain section, where the soils are derived from deposition of weathered material in shallow or deep seas, during which process they have been long washed in flowing water or on wave-beaten shores.

On the other hand, those types of soil characterized by their wet and marshy condition are rich in all elements and conditions essential to plant growth. There is, however, the difficulty of clearing and draining them which governs the extent of their cultivation. Should market facilities become such as to warrant the necessary expenditure, practically all of the Portsmouth sand and some of the Meadow can be cultivated.

The leading crops grown in the area are tobacco, cotton, sugar cane, corn, oats, sweet potatoes, and peanuts. Small quantities of field peas, velvet beans, and cassava are also grown. There is no system of rotation practiced, and the succession of crops is irregular. Statistics gathered by the State commissioner of agriculture in 1900 show the average yield per acre of these crops in the county to be 0.33 of a bale of cotton, 11.2 bushels of corn, 9.6 bushels of oats, 76.9 bushels of sweet potatoes, 584 pounds of tobacco, 7.5 barrels of cane sirup, and 20 bushels of peanuts.

The soil is given a shallow plowing with a light, one-horse Dixie plow, and the commendable practice of plowing on contours is commonly followed. By this method the land is plowed and all the crops planted on lines of equal elevation, which, however, has the disadvantage of making the rows much curved. These rows are maintained from year to year. Contour ditches are also constructed to prevent washing of the soil. For any of the crops planted in rows the general practice is to turn two furrows together between the previous year's rows. A second furrow slice is then laid to each side, and in the resulting furrow the fertilizer is distributed by hand through a fertilizer "straw." A little soil is turned back and the seed planted in this depression. The soil is then gradually worked back to the row by means of shallow-running sweeps until at the time of harvesting the crop stands on a ridge. The work of seeding is performed by hand, and the seed is covered with a small shovel plow.

Sugar cane is propagated by cuttings of the stalk, which bud at the joint. The cane is piled in windrows in the fall with all the leaves attached, and is covered with a few inches of soil to protect it from frosts. In spring the earth is removed, the decayed leaves stripped off, and the stalks cut into lengths of 1½ to 2 feet. About 2,000 stalks are required to plant one acre. It is sometimes possible, by throwing two shallow furrows over the roots of the cane in the fall, to secure a second crop from the same planting, but this method is not generally practiced. In the fall the cane is topped and stripped as it stands in the field, after which it is cut and carted to the mill. If there is danger of severe frost before all the crop can be ground it is cut and banked as for seed.

The best farmers apply about a half ton of fertilizer, consisting of a complete guano and cottonseed mixture, to each acre of cane land. A fertilizer containing 8 per cent of phosphoric acid, 3 per cent of potash, and 2 per cent of nitrogen is considered the most desirable. Fertilizers are also used on the cotton, corn, oat, and other crops in amounts ranging from 100 to 500 pounds per acre. The tobacco crop grown under shade receives the highest fertilization. Different growers vary in the kinds and quantities applied. Some companies use barnyard manure exclusively, to furnish which many head of cattle are kept. Others apply chemicals, in the form of a potash mixture, with cottonseed hulls and meal, and some use barnyard manure with the cottonseed products. For this crop the amount of stable manure used is limited to 15 tons per acre, because of injurious effects on the burn of the leaf if larger amounts are used. Leguminous green manures are never used on tobacco fields. In fertilizing tobacco soils it is necessary, as far as possible, to avoid any material that contains chlorine or a sulphate, such as acid phosphate, since these impair the burn of the leaf.

AGRICULTURAL CONDITIONS.

A general idea of the agricultural conditions of the county may be obtained from statistics published by the Twelfth Census, which show that in 1900, of the 327,680 acres in the county, 212,022 acres were in farms, 79,135 acres of which were improved. There has been no material change in this condition since. Large bodies of forest exist, particularly in the western and southern parts of the county. A large part of the longleaf pine trees have been tapped for turpentine, and five distilleries now exist in the county.

Of the 1,359 farms in the county in 1900 practically all had buildings on them. The average size of the farms was 137 acres, of which 51 acres were cultivated. The average value of the farms, exclusive of buildings, was $728; of the buildings, $283; of implements and

machinery, $162; of live stock, $155, and of products not fed to live stock, $487. The average expenditure for labor was $31 per farm, and for fertilizers, $27.

A great many of the farmers of the county are negro tenants who usually work a "one-horse" farm of 30 acres and pay as rent a part of the crops produced. These usually expend very little for implements, labor, or fertilizers. The average white farmer cultivates from 80 to 150 acres of land, which he usually owns, and his expense for labor and fertilizer is probably somewhat greater than the average given by the census for all classes. Besides these there are a number of companies that control thousands of acres, being especially engaged in the production of cigar wrapper tobacco.

The recent development of the tobacco industry began about the year 1886, when tobacco seed from Cuba was tried on both heavy upland and hammock soils. On the former a very fair grade of cigar filler was produced, but as the growing of wrappers on fresh hammock land was found more profitable, that branch of the industry received more attention. In 1887 several large companies came into the region for the purpose of tobacco growing, and for a few years the business throve. By 1892, however, such business depression had come about that the acreage of tobacco in the county was very small. In casting about for a more suitable leaf a man in the adjoining county of Decatur, Ga., in that year planted some Sumatra seed on fresh hammock land, which produced a highly satisfactory cigar wrapper leaf. Its cultivation spread to Gadsden County and increased rapidly, but as yet only a part of the crop could be used for wrappers. In 1896 a prominent tobacco grower of the region noted the effect of pineapple shade on tobacco plants accidentally seeded with the cotton seed used for fertilizer. About that time he visited Cuba and was impressed with the superior quality of leaf derived from tobacco plants grown in the shade of banana plants. He therefore decided to erect a small slat shade and grow an experimental crop. In 1897 the area of shade was increased to 5 acres, from which small beginning the industry has grown to its present proportions.

The companies operating in the county are chiefly interested in the production of cigar wrapper leaf tobacco. They have made large investments in buildings, shade, labor, and machinery. In 1902 there were between 1,200 and 1,500 acres under shade, either slat or cloth, costing from $200 to $300 per acre, and the area is still being extended. The expenditures for fertilizer range from $50 to $100 an acre annually. Large herds of cattle are maintained, mainly to produce manure. It has been found that when grown under shade the quantity of the tobacco can be greatly increased without impairment of the quality, by the heavy application of fertilizer and manure, and from 2,000 to 3,000 pounds to the acre is not considered excessive, although in the

earlier days, when the crop was produced in the open on hammock lands, 200 to 300 pounds was about the average quantity used.

There has also been much capital invested in irrigation projects, and about 750 acres of tobacco land are now provided with water. There are two systems in use. One distributes the water, after raising it by steam, gasoline, or water power, through troughs and small ditches. The other, which has been applied to about 60 acres, distributes the water by means of overhead pipes and sprays. The former system costs about $50 per year per acre; the latter about $400 per acre for installation, and a subsequent annual outlay of $10 per acre. The overhead system gives the more satisfactory results.

While the growth of Sumatra leaf has had a most phenomenal development there has also been a great increase in the production of Cuban filler leaf, and at present both these interests are being extended. The Sumatra is a fine-textured, thin, elastic leaf particularly adapted to the wrapping of cigars. It brings a high price compared with other wrapper tobaccos produced in the United States, but is more economical to use, giving less waste, and pound for pound covering a much greater number of cigars. As many as 2,000 cigars have been wrapped from 1 pound of Sumatra. The finest quality of leaf is difficult to distinguish from the best leaf grown in the island of Sumatra. The Cuban filler tobacco grown in the county has the reputation of being the best domestic filler so far produced on a commercial scale. It was this type that attracted the attention of the New York cigar manufacturers to Gadsden County, and caused the formation by them of the companies which revived the tobacco industry in this part of Florida.

The yield per acre of shade-grown Sumatra ranges from 800 pounds on the lighter sandy soils to 1,400 pounds on the heavier clay soils, while the Cuban filler type may yield at the first cutting 600 pounds, and often from the sucker crops 400 pounds, although the average is considerably below these figures. According to the census of 1900 Gadsden County produced 1,016,550 pounds of both types of tobacco in 1899 on 1,738 acres. Of this quantity the greater part was wrapper leaf.

Colored labor prevails throughout the county. In the larger tobacco concerns the workers, including women and children, are under the direction of foremen, over whom are superintendents who are, in turn, under a general manager. The managers and superintendents are white; the foremen are generally colored. In this industry children receive from 15 to 25 cents a day, women from 30 to 40 cents, men from 40 to 50 cents, and foremen 60 cents. The average working day is 14 hours. For such laborers the pay is considered good. The necessity for a large number of laborers at certain seasons leads to a great scarcity at those times, and one of the problems of management is the proper utilization of the available working force.

According to figures given by the Florida commissioner of agriculture, in 1900 short staple cotton was produced to the amount of 677 bales, and sea-island cotton to the amount of 243 bags. The production of cane sirup was given as 4,940 barrels, but has been much increased in the last two seasons. Prior to 1901 cane was grown only in a small way, but the area has since been greatly increased. In place of small horsepower mills, with a capacity of 1 or 2 barrels a day, large power mills with steam evaporators have been introduced. These employ the most up-to-date methods and turn out a high grade of sirup. The acreage of cane planted next season (1903) will be greater than in any previous year. It is grown on the heavy sandy loams and clays. The moisture supply is a most important factor in the development of saccharine matter in the plant. The use of barnyard manure deepens the color and injures the quality of the product.

In addition to the crops mentioned there were grown, in 1900, 209,222 bushels of corn, 18,776 bushels of oats, 99,905 bushels of sweet potatoes, and 69,760 bushels of peanuts. There was also a small acreage of rice in the meadow land, besides field peas and hay. Several acres of cassava were tried with success in 1902. The velvet bean has been introduced, and the beggarweed thrives in a wild state.

Not many farm animals are kept, and these few are of inferior grade. Most of the cattle are maintained for manurial purposes by the large tobacco concerns. The swine are almost entirely of the ranging "razor-backed" variety. No attention has been paid to the production of live stock or animal products.

The leading fruits grown are Kieffer and Leconte pears, Scuppernong grapes, and a few peaches. With the exception of small amounts of the first-named fruit, none of these are shipped out of the area. Watermelons and truck crops are grown for local consumption. It would seem that sufficient fruit and truck should be produced to supply the home demand.

The county's outside traffic depends on two railroads. The Seaboard Air Line Railway runs through Quincy, leading to Jacksonville and Pensacola, and the Georgia, Florida and Alabama Railway traverses the eastern part of the county. Another road, the Atlantic Coast Line Railroad, touches the county at River Junction. A line of boats on the Apalachicola River, between Columbus, Ga., and the coast, affords an outlet for some of the products of the county. There is need of competing lines to reduce freight rates.

The county road system is irregular, to conform to the topography of the country, and the roads are surfaced with the natural soil. They have been graded around the towns and along the main thoroughfares. The roads vary in texture from clay to light sand. The approach to some of the streams is very steep.

The soil conditions prevailing in the county are such as to permit a very much larger extension of the agricultural interests. The production of cigar wrappers of the Sumatra type can be extended almost indefinitely on the yellow clays and on the heaviest sandy loams that now occupy large uncultivated areas. If irrigation is desired, the necessary supply of water is available in the many small streams that traverse the region. Reservoirs and lakes can be constructed at comparatively small cost. On some of the types, particularly on the Orangeburg sandy loam, the growing of dark filler tobacco is practicable, and it may be found possible to develop a very superior quality of leaf.

The sugar-cane industry, which is just taking on new life, may be greatly extended on the areas of Norfolk fine sandy loam. Other types of soil are also suited to this industry, but to a less degree. By the use of larger amounts of fertilizers and green manures the yield of cotton may be increased to a bale per acre. Leguminous crops can and should be grown in larger amounts to afford a supply of humus for the soil and to furnish forage. Peanuts, cowpeas, velvet beans, and beggarweed are excellent for this purpose, and to these may be added the soy bean and alfalfa. The last-named plant will thrive on the heavier sandy loams, and by means of its deep root system can withstand more severe drought than the other leguminous crops. There is some evidence that the tubercle bacteria that usually thrive on the roots of the leguminous plants are absent. Their presence or absence in the soil should be determined in each case, and care should be taken to introduce, where necessary, suitable cultures for all such crops.

It seems probable that increased yields of all crops would be obtained by a change from the prevailing system of ridge cultivation. By this method the roots of plants are nearest the surface at the time when they should be deeply covered with moist earth. This is not so where the practice of shallow, level cultivation is followed.

The only moderate productiveness of the soils, the distance of markets, and the climatic conditions are some of the reasons why live stock should be kept in much larger numbers. They are able to utilize the leguminous forage that should be grown and to reduce it to a concentrated form for market, while at the same time returning to the land for its enrichment the bulk of the food consumed. The cattle should be of good grade, and should thrive with the minimum amount of shelter.

There is much in the agricultural conditions of the county to encourage the belief that a larger degree of prosperity will yet be attained by the farmers of this area.

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BUREAU OF SOILS
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SOIL MAP

FLORIDA
GADSDEN COUNTY SHEET

R. 6 W. | R. 5 W. | R. 4 W. | R. 3 W. | R. 2 W. | R. 1 W.

T. 3 N. | T. 2 N. | T. 1 N. | T. 1 S.

SOIL PROFILE
(3 feet deep)

- Orangeburg sandy loam: Ssc / C
- Orangeburg sand: Ssc / Ssc / C
- Norfolk fine sandy loam: Ssc / Ssc / C
- Norfolk sandy loam: Ssc / Cs / C
- Gadsden sand: Ssc / Ssc
- Norfolk sand: Ssc / S
- Ocklocknee clay: Ssc / C
- Portsmouth sand: Ssc / Cpc
- Meadow: Sc

LEGEND

Ssc Sandy loam
C Clay
Cpc Clay and sand
S Sand
Sc Loam

LEGEND

- Osl — Orangeburg sandy loam
- Os — Orangeburg sand
- Nc — Norfolk fine sandy loam
- Nsl — Norfolk sandy loam
- Gs — Gadsden sand
- N — Norfolk sand
- O — Ocklocknee clay
- Bs — Portsmouth sand
- M — Meadow

Soils surveyed by
Elmer O. Fippin and Albert S. Root
1903

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1903